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NEW SPECIES AND NEW RECORDS FOR THE MALVACEAE OF BAJA CALIFORNIA SUR

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INTRODUCTION

The tropical dry forest of Baja California Sur is in one of the driest areas in which this subtropical type of vegetation is found (Fig. 1). It is a disjunct plant community, most similar to that found in the foothills and canyons of the Sierra Madre Occidental of southern Sonora (Shreve 1934, 1937), where it extends about 4° of latitude farther north. Both localities meet the Sonoran Desert at their northern boundaries, but the peninsular one has been developed in isolation at least since the last expansion of a xerothermic period, some thousands of years ago (Axelrod 1979). Both the Gulf of California and the desert seem to have played an effective role as geographic barriers since that time. This dry-season deciduous forest covers an approximate surface area of 1750 km^2 and occupies foothills, hills, and middle mountain slopes in the range of 400–1000 m. The best expression of the community is located in the canyons of the Sierra de La Laguna; outside it, the composition and structure of the forest gradually degrades. This community has been floristically documented by several authors in the last century. León de la Luz et al. (unpublished data), based on their own collections, have been updating early information from Brandegee (1892) and Wiggins (1980); at present 575 species of vascular plants have been reported for this community, of which 42 (7%) can be considered as endemics. According to the present flora, the ratio of families/genera is 1/3.5, that of genera/species is 1/1.8, values that resemble ratios found in island floras. Recent collections in La Burrera Canyon, in the vicinity of Todos Santos, B. C. S., have brought to light two new species of Malvaceae (cf. Wiggins 1980) that are very distinct, and which are described and illustrated below. Following that, some range extensions and noteworthy recent collections of Malvaceae from the region described are presented.

LA BURRERA CANYON

All of the localities included in this report (except one, the report for *Sida hyalina*) come from La Burrera Canyon (23°29'N, 110°00'W), which is within the only tropical dry forest in all the Baja California peninsula. It is located within the

Biosphere Reserve of the Sierra de La Laguna, Baja California Sur (see Fig. 1). Above the forest, a woodland community is found, where climate and flora are well delimited by a sharp boundary in the mountain gradient. In the alluvial plains of the lowlands, below 400 m, the dry forest mingles with the xerophytic vegetation of the Sonoran Desert in a transition of gradual change over tens of kilometers.

Families with the greatest richness prior to this report are Leguminosae, Compositae, Polypodiaceae, Convolvulaceae, and Malvaceae, the last with 8 genera and 23 species and infraspecific taxa (no endemics recognized yet). Physiognomically dominant species in La Burrera Canyon are *Lysiloma divaricata, Pachycereus pecten-aboriginum, Tecoma stans, Adelia virgata, Karwinskia humboldtiana, Jatropha vernicosa,* and *Albizzia occidentalis.*

According to the official Mexican climatic chart (SPP-INEGI, 1981), La Burrera Canyon and most of the tropical dry forest of the Sierra de La Laguna are located in the Koeppen BS climatic types (subtypes dry and semi-hot to semi-dry and semi-hot, winter precipitation less than 10% of the annual total). It is possible to consider a single rainy season, which goes from July to January, but two periods are generally recognized: September and January. Some climatic stations report up to 600 mm of annual precipitation, but temperature is probably the most important limiting factor, since in the summer soil-surface temperatures can reach 60°C and air temperatures 45°C. Soils are derived from the decomposition of granitic rocks. All of them are immature without differentiated layers; the rocky character is variable. Landforms are basically arroyos and grassy slopes. The highest diversity of plant life-forms and density of individuals is found alongside the arroyos. Nevertheless, in a study of endemism, León de la Luz et al. (1995) found that 75% of the endemics grow on the slopes of the range, where water and shade are less available than in the arroyos.

NEW SPECIES

Malvastrum hillii Fryxell, León de la Luz & Domínguez, sp. nov.—TYPE: MEXICO. Baja California Sur: El Chilicote, 2 km S de Corral Gde. La Burrera, Todos Santos, 23°30'N, 110°02'W, 970 m, 18 Feb 1990, *Domínguez L. 77* (holotype: TEX!; isotype: HCIB!). Fig. 2.

Frutex caulibus rubellis sparse stellato-pubescentibus; laminis foliorum ovatis 5–8 cm longis; inflorescentiis spiciformibus; calycibus 8–13 mm longis ciliatis; petalis luteis 8–10 mm longis; columna staminalis glabris, 3–4 mm longis; mericarpiis ca. 13 in apiculo hirsutis, cuspide apicalis brevis (0.5 mm) atque cuspidibus dorsalis duabus (1 mm), parietibus lateralis fere laevibus.

Perennial shrubs ca. 1 m tall, the stems reddish, sparsely stellate-pubescent (becoming glabrescent), the hairs 3–5-armed, shortly stipitate, without preferential orientation. Leaf blades ovate, basally truncate, coarsely crenate-serrate, acute, palmately 5-nerved, 5–8 cm long, 3–5.5 cm wide, the upper surface with sparse hairs 0.5–1 mm long that are stellate, bifurcate, or simple, the lower surface with only stellate hairs; petioles 1–3 cm long, with pubescence denser than that of the stem; stipules broadly linear, 7–8 mm long (but very early deciduous, leaving only scars). Inflorescence usually a terminal spiciform raceme, but the earliest flowers solitary in the leaf axils; pedicels solitary, 0.5–1.5 cm long, with pubescence similar to that of the stem, reduced upward and subsessile at the summit; bracts of the

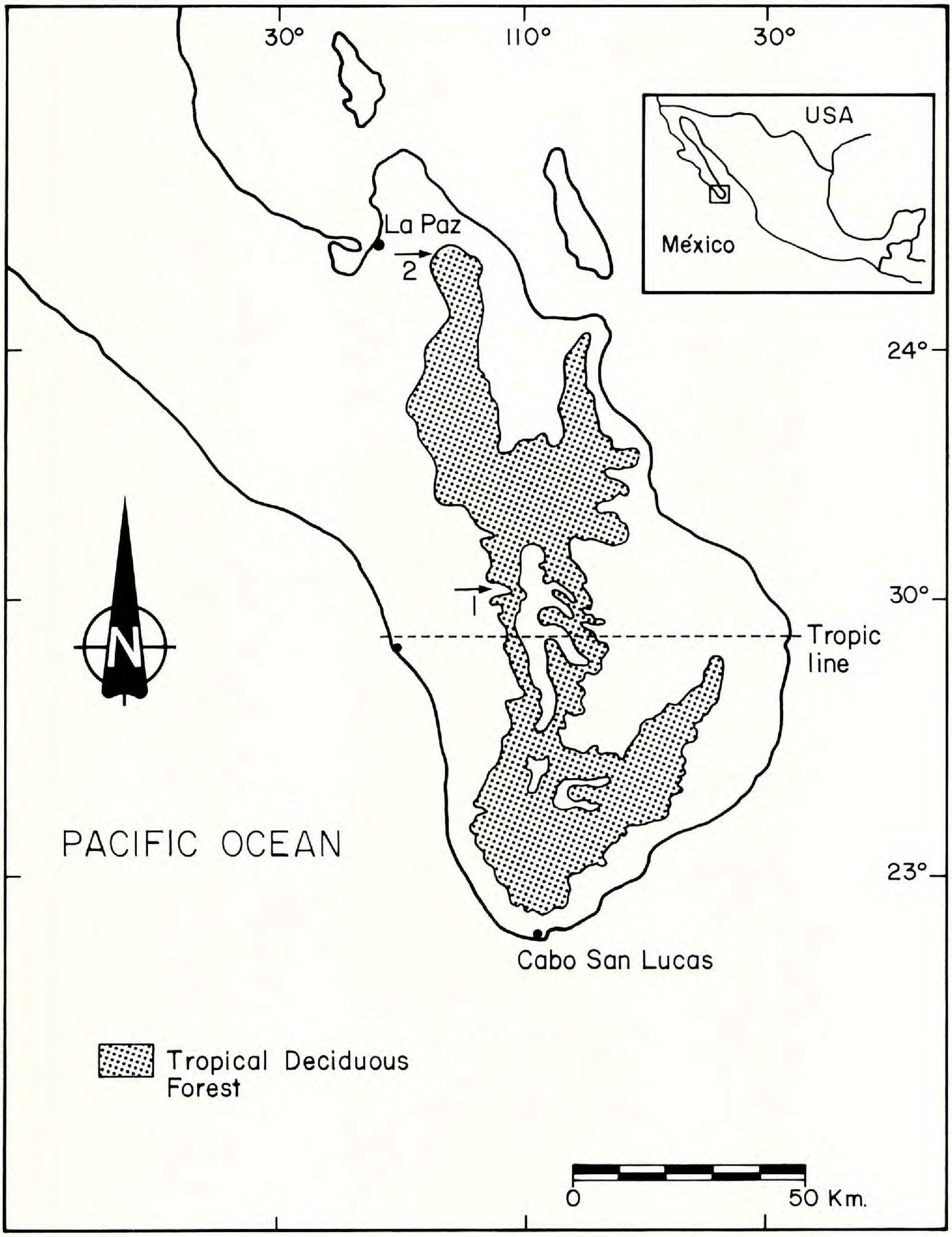


FIG. 1. Collection sites cited. Site 1, La Burrera Canyon, is a typical locality for tropical deciduous forest. *Malvastrum hillii* and *Sidastrum burrerense* were collected here, as well as *Sida alamosana* (*S. glabra*), *S. acuta*, and *Bastardia bivalvis*. Site 2, Cerro Aguas Escondidas lies between the tropical deciduous forest and the sarcocaul scrub of the Sonoran Desert, and is the locality where *Sida hyalina* was found.

involucel 3, liguliform, 7–12 mm long, 1 mm wide; calyx 8–13 mm long, stellate-pubescent and ciliate on the margin; petals yellow, 8–10 mm long, glabrous; staminal column 3–4 mm long, pallid, glabrous; filaments apical, 1–2 mm long, the anthers numerous; styles ca. 13, exceeding the androecium, the stigmas capitellate. Fruits

FIG. 2. *Malvastrum hillii*. Left-hand branch and left hand mericarp (*Domínguez 472*); right-hand branch, fruit, and right-hand mericarp (*Domínguez 77*).

oblate or disciform, 7 mm in diameter, reddish brown; mericarps ca. 13, horseshoe-shaped with a prominent ventral notch, 2.5 × 4 mm, with a small apical cusp (0.5 mm) and two dorsal cusps (1 mm), apically hirsute (hairs to 0.5 mm long), glabrous basally and laterally, the lateral walls nearly smooth.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** Baja California Sur: "Los Gallos," Rancho La Burrera NE de Todos Santos, Mpio. La Paz, 23°20'N, 109°59'W, 750 m, 2 Dec 1992, *M. Domínguez L. 472* (HCIB, TEX).

Malvastrum hillii is found in low deciduous forest at elevations of 750 to 970 m, where it is fairly abundant. It flowers in December; fruiting follows in February.

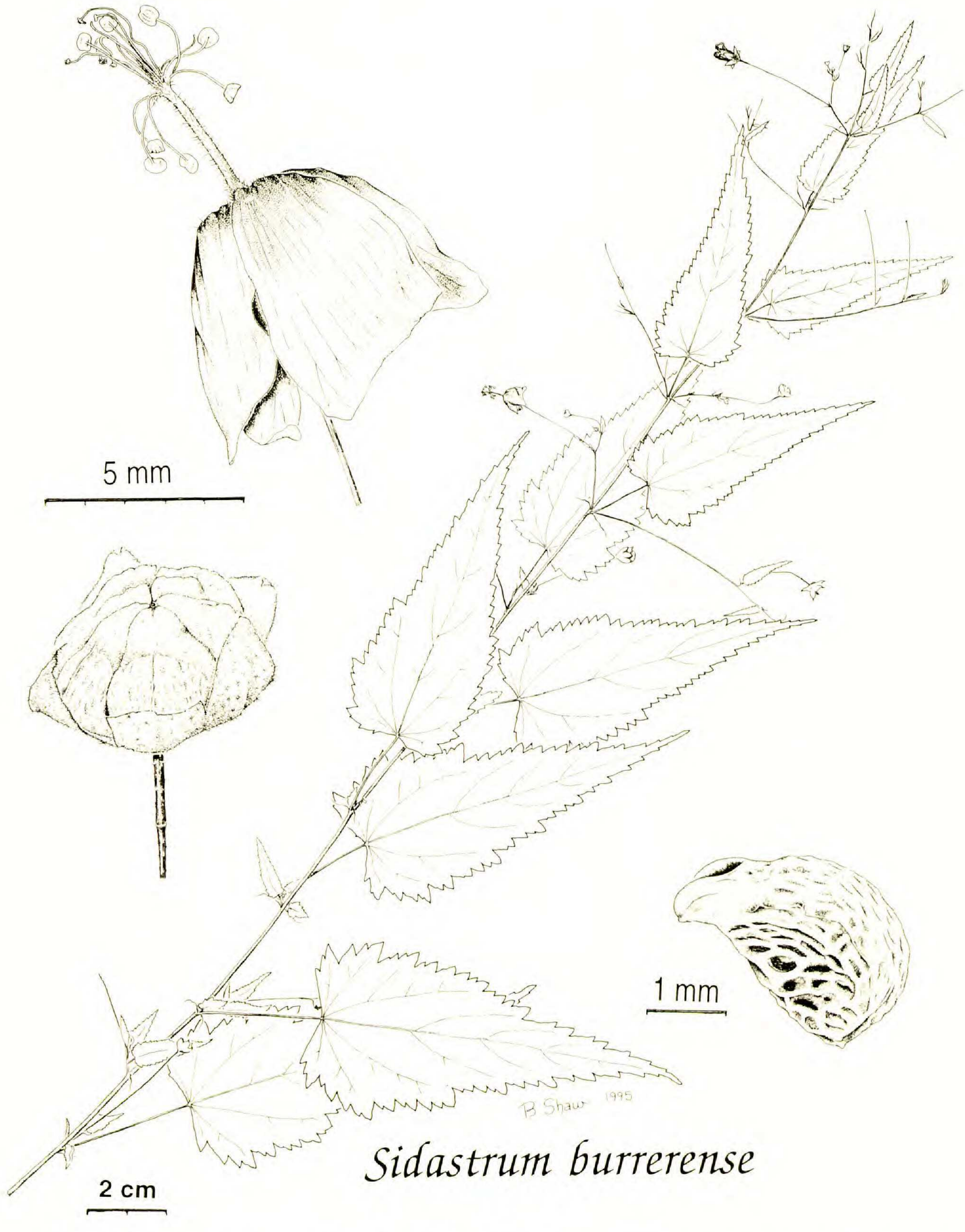
The specific epithet honors S. R. Hill, whose noteworthy monograph of the genus *Malvastrum* (Hill 1982) is a model of a good monograph and the principal source of our knowledge of the genus.

Wiggins (1980) recorded only *Malvastrum coromandelianum* (L.) Garcke for Baja California, but Hill (1982) and Fryxell (1988) also reported *M. bicuspidatum* (S. Watson) Rose subsp. *bicuspidatum* for the peninsula, but farther to the north than *M. hillii*. The relationship of the new species is problematical. Geographically one might compare it to *M. bicuspidatum* (with various subspecies), but it does not appear to be of this affinity. In general aspect, especially in the large flowers, there are similarities to the Bolivian species, *M. grandiflorum* Krapovickas (see Hill 1982: 256, fig. 56). There is support for this affinity in the presence of an apical cusp on the mericarp, in addition to the two dorsal cusps, and in the size of the leaves, which are relatively large. The flowers and the fruits are also relatively large, but not as large in *M. hillii* as they are in *M. grandiflorum*. The mericarps of *M. hillii* do not have the prominent ribs on the lateral walls that are characteristic of *M. grandiflorum* (see Hill 1982: 254, fig. 55). Clearly, *M. hillii* is distinct from *M. grandiflorum*, but it is not certain if it is allied with this species or if it is of a different affinity.

Sidastrum burrerense Fryxell, León de la Luz & Domínguez, sp. nov.—TYPE: MEXICO. Baja California Sur: "Los Gueribos," Cañón La Burrera, 25 km al NE de Todos Santos, 23°29'N, 109°57'W, 2 Nov 1994, 550 m, *R. Domínguez C. 1257* (holotype: TEX!; isotype: HCIB!). Fig. 3.

Suffrutex caulibus atque foliis sparsissime atque minutissime puberulentis glabrescentibus; laminis foliorum ovato-lanceolatis, valde serratis; inflorescentiis paniculatis terminalibus pedicellis gracilis; calycibus ecostatis; petalis purpurascentibus, reflexis; columna staminalis hirsutis; mericarpiis 6–7, valde atque subtiliter reticulatis.

Perennial subshrub, the stems terete, sometimes reddish, very sparsely and minutely puberulent becoming glabrescent. Leaf blades narrowly ovate to lanceolate, basally truncate or subcordate, with a weak tendency to be hastately lobed, palmately 7-nerved, coarsely and irregularly crenate-serrate, gradually acuminate, 4–9 cm long, 1.5–4.5 cm wide, sparsely and inconspicuously pubescent, the upper surface with simple hairs 0.3 mm long and a few stellate hairs, the lower surface with stellate hairs 0.2 mm in diameter dispersed uniformly; petioles 0.5–4 cm long with pubescence similar to that of the young stems and sometimes with a few simple hairs to 1 mm long; stipules filiform, 7–8 mm long. Flowers solitary in the leaf axils or on lateral branches, forming a terminal paniculiform inflorescence, more or less exceeding the leaves; pedicels slender (almost capillary), 2–3 cm



Sidastrum burrerense

FIG. 3. *Sidastrum burrerense*. Branch and flower (*Domínguez 1257*); fruit and mericarp (*Domínguez 125*).

long, glabrous; calyx 4–4.5 mm long, minutely stellate-pubescent, ecostate, divided more or less to the middle; petals 5–6 mm long, reflexed, lavender or purplish; staminal column 4 mm long, sometimes purplish, with prominent white hairs 0.3 mm long; filaments apical, few (5–10), 1.5 mm long, the anthers whitish; styles 6–7, exceeding the androecium, the stigmas capitellate. Fruits oblate, 4.5–5 mm in diameter; mericarps 6–7, ca. 3 mm long, finely reticulate in the basal part, with a small apical rostrum, smooth; seeds solitary, ca. 2 mm long.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** Baja California Sur: "La Testera," Cañón La Burrera, NE de Todos Santos, 23°30'N, 109°59'W, 620 m, 3 Jan 1991, *M. Domínguez L. 125* (HCIB, TEX).

The type locality is described as a wet arroyo with low deciduous forest and riparian vegetation. *Sidastrum burrerense* is found between 550 to 620 m elevation, where it is rare to abundant. It flowers in November and fruits in January.

The specific epithet notes that this species is characteristic of the La Burrera Canyon. *Sidastrum burrerense* is the fifth species of the genus known from Mexico (Fryxell 1978, 1988) and is isolated from the others geographically (see the maps in Fryxell 1988: 411, 420). It has a very similar aspect to that of *S. tehuacanum* but has reflexed petals similar to those of *S. paniculatum*. The color of the corollas is intermediate between these species. Similarities between *S. burrerense* and *S. tehuacanum* include the form and dentition of the leaves, the type of pubescence, and the number of the mericarps. Differences include the size of the leaves (larger in *S. burrerense* than in *S. tehuacanum*), the pubescence of the staminal column (hirsute in *S. burrerense*, glabrous in *S. tehuacanum*), the size of the calyx (4–4.5 mm in *S. burrerense*, 2–4 mm in *S. tehuacanum*), the reticulation of the mericarp (dorsally reticulate in *S. burrerense*, dorsally smooth in *S. tehuacanum*), and characteristics of the corolla (purplish and reflexed in *S. burrerense*, pale rose and rotate in *S. tehuacanum*).

KEY TO THE MEXICAN SPECIES OF SIDASTRUM

1. Inflorescences racemiform; leaves narrowly lanceolate-elliptical, obscurely serrate, pubescent above; stems densely stellate-pubescent; corolla yellow; mericarps 5.
   S. strictum (Standley) Fryxell.
1. Inflorescences paniculate, often with capillary pedicels; leaves narrowly lanceolate-elliptical to ovate, glabrous or pubescent above; stems densely to sparsely pubescent or glabrous; corolla yellow, lavender, or purplish; mericarps 5–8.
   2. Leaves narrowly lanceolate-elliptical, obscurely serrate, glabrous above; corolla yellow; mericarps 5.
      S. lodiegense (E. G. Baker) Fryxell.
   2. Leaves lanceolate to ovate, serrate, pubescent or glabrous above; corolla lavender, purplish or yellowish; mericarps 5–8.
      3. Corolla purplish, reflexed; stems densely stellate-pubescent; leaves serrate, stellate-pubescent above.
         S. paniculatum (L.) Fryxell.
      3. Corolla lavender or yellowish, reflexed or rotate; stems sparsely pubescent to glabrate; leaves notably serrate, subglabrous above.
         4. Corolla lavender, reflexed; staminal column hirsute; calyx 4–4.5 mm long; mericarps finely reticulate laterally and dorsally.
            S. burrerense Fryxell, León de la Luz & Domínguez.
         4. Corolla yellowish (sometimes fading pale lavender), rotate; staminal column glabrous; calyx 2–4 mm long; mericarps reticulate laterally, smooth dorsally.
            S. tehuacanum (Brandegee) Fryxell.

RANGE EXTENSIONS

Recent collections in Baja California Sur have brought to light the following range extensions to the peninsula of Baja California of Malvaceae previously known only from mainland Mexico.

1. *Sida alamosana* S. Watson (or *S. glabra* Miller?). Mpio. de La Paz, ca. Rancho La Burrera, 23°29'N, 110°01'N, 480 m, herbacea anual, márgenes del arroyo, selva baja caducifolia, 3 Dec 1990, *M. Domínguez 29* (HCIB, TEX).

2. *Sida hyalina* Fryxell. Mpio. de La Paz, Cerro Aguas Escondidas, E de La Paz, 24°08'N, 110°08'W, 100 m, herbacea perenne, ladera rocosa, matorral sarcocaule, 29 Oct 1990, *León de la Luz 4722* (HCIB, TEX).

3. *Bastardia bivalvis* (Cav.) H. B. K. Mpio. de La Paz, Rancho La Burrera, "El Garbancillo," 23°29'N, 110°01'W, 600 m, herbacea perenne, en ladera, selva baja caducifolia, 2 Dec 1992, *M. Domínguez 467* (HCIB, TEX).

4. *Sida acuta* Burm. f. Mpio. de La Paz, Sierra de la Laguna, "El Palmillar," 23°28'N, 110°00'W, 900 m, arroyo húmedo, selva baja caducifolia, 6 Nov 1990, *León de la Luz 4821* (HCIB, TEX).

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